An Overview of Artificial Intelligence Applications for Power Electronics

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Abstract

This article gives an overview of the artificial intelligence (AI) applications for power electronic systems. The three distinctive life-cycle phases, design, control, and maintenance are correlated with one or more tasks to be addressed by AI, including optimization, classification, regression, and data structure exploration. The applications of four categories of AI are discussed, which are expert system, fuzzy logic, metaheuristic method, and machine learning. More than 500 publications have been reviewed to identify the common understandings, practical implementation challenges, and research opportunities in the application of AI for power electronics. This article is accompanied by an Excel file listing the relevant publications for statistical analytics.